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**Title :** Genetic analyses reveal contrasting modes of transmission of different foraging traditions within a single population of bottlenose dolphins (*Tursiops* sp.)

**Category :** Behavior

**Student :** Not Applicable

**Preferred Format :** Oral Presentation

**Abstract :** Shark Bay bottlenose dolphins comprise the only cetacean species in which several different foraging specialisations within a single population have been documented. A minority of dolphins whose ranges overlap with the rest of the population have adopted different strategies in three exclusive groups. 1. Individuals use marine sponges as tools to forage in deeper water habitats ('spongers'). 2. Dolphins hydroplane in extremely shallow water to drive prey-fish onto a beach, catching prey by beaching themselves ('beachers'). 3. Animals have learned to accept fish handouts from humans ('provisioned dolphins').

We tested the hypothesis that foraging specialisations were transmitted vertically with limited horizontal leakage within a matriline (i.e., learned from the mother). In this case, animals adopting a particular technique should be significantly more closely related than the population average and show limited haplotype diversity. By contrast, if a behaviour was spread non-vertically through a population, both relatedness levels and haplotype diversity are not expected to be different from the population average.

We used 10 microsatellite loci to calculate pairwise relatedness ( $r$ ) for 305 sampled individuals, and mitochondrial DNA to test the mode of transmission for these unusual and highly specialised behaviours. After removal of all known offspring in each group, Monte-Carlo simulations showed that spongers ( $n=13$ ) and beachers ( $n=4$ ) showed significantly elevated  $r$  (spongers: mean  $r=0.089$ ,  $P<0.001$ ; beachers: mean  $r=0.120$ ,  $P=0.031$ ; 10000 randomisations; population mean  $r=-0.004$ ). Haplotype diversity was dramatically reduced among all spongers, who shared the same haplotype ( $P<0.001$ , Fisher's exact test); but not for beachers ( $P=0.082$ ), indicating strong vertical transmission for sponging, but not for beaching. The provisioned dolphins ( $n=3$ ) were not more closely related than expected by chance ( $P=0.563$ ), nor was their haplotype diversity significantly reduced ( $P=0.345$ ). To our knowledge, this is the first study to suggest contrasting modes of transmission of foraging traditions within a single marine mammal population.